IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of: Yee Loong Chin *et al.*	Group Art Unit: 2826
Application No.: 10/602,374	Examiner: Erdem, Fazli
Filed: June 23, 2003	Docket No.: 70030419-1
	Confirmation No.: 1701

For: **Optical Source Having Integral Diffractive Element**

SEVENTH RESPONSE

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Smith Frohwein Tempel Greenlee Blaha LLC
Customer Number 35856

Sir:

In response to the non-final Office Action mailed October 23, 2006, Applicants submit the following remarks.

The Listing of Claims begins on page 2 of this paper.

Remarks begin on page 5 of this paper.

AUTHORIZATION TO DEBIT DEPOSIT ACCOUNT

It is not believed that extensions of time or fees for net addition of claims are required, beyond those, which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 C.F.R. §1.136(a), and any fees required therefor (including fees for net addition of claims) are hereby authorized to be charged to Avago Technologies Deposit Account No. 50-3718.

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. § 1.8

I hereby certify that this correspondence, including any items indicated as attached or included, is being transmitted via EFS Web to the United States Patent and Trademark Office on the date indicated below.

Date: 1/17/07 Signature – Michael J. Tempel

AMENDMENTS

Listing of Claims

The following listing of claims replaces all prior versions. Please amend the claims as follows:

Claims 1-3 (canceled).

Claim 4 (previously presented): An optical source, comprising:

an optical emitter;

an encapsulant covering the optical emitter; and

a diffractive element integrated into the encapsulant, wherein the encapsulant intercepts and passes light from the optical emitter to the diffractive element, wherein the diffractive element diffracts the light to form a predesignated optical radiation pattern and wherein the optical emitter is positioned at a conductive mounting site of a conductive heat sink and the optical source is a surface mount device.

Claims 5-7 (canceled).

Claim 8 (original): An optical source, comprising:

an optical emitter providing an optical signal; and

a diffractive element integrated into an encapsulant covering the optical emitter, intercepting the provided optical signal and diffracting the optical signal to form a predesignated optical radiation pattern.

Claim 9 (original): The optical source of claim 8 wherein the optical emitter is an LED.

Claim 10 (original): The optical source of claim 8 wherein at least one of the optical emitter and the encapsulant includes a secondary emitter.

Claim 11 (original): The optical source of claim 8 wherein the diffractive element has

one of a binary grating profile, a sawtooth grating profile, a sinusoidal grating profile, a multiple phase-level grating profile, and a binary subwavelength grating profile.

Claim 12 (original): The optical source of claim 8 wherein the encapsulant covering the optical emitter encases the optical emitter.

Claim 13 (original): The optical source of claim 9 wherein the optical emitter is positioned at a conductive mounting site of a conductive lead.

Claim 14 (original): The optical source of claim 11 wherein the optical emitter is positioned at a conductive mounting site of a conductive lead.

Claim 15 (original): The optical source of claim 9 wherein the optical emitter is positioned at a conductive mounting site of a conductive heat sink and the optical source is a surface mount device.

Claim 16 (original): The optical source of claim 11 wherein the optical emitter is positioned at a conductive mounting site of a conductive heat sink and the optical source is a surface mount device.

Claim 17 (canceled).

Claim 18 (canceled).

Claim 19 (withdrawn): A method, comprising:

generating an optical signal with an optical emitter;

transmitting the optical signal through an encapsulant;

diffracting the optical signal transmitted through the encapsulant by a diffractive element integral to the encapsulant to form a predesignated optical radiation pattern.

Claim 20 (withdrawn): The method of claim 19 wherein the diffractive element has one of a binary grating profile, a sawtooth grating profile, a sinusoidal grating profile, a

multiple phase-level grating profile, and a binary subwavelength grating profile.

REMARKS

This is a full and timely response to the non-final Office Action mailed by the U.S. Patent and Trademark Office on October 23, 2006. Claims 4 and 8-16 remain pending in the present application. In view of the following remarks, reconsideration and allowance of the present application and claims are respectfully requested.

Rejection Under 35 U.S.C. § 103

Claims 4 and 8-16 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,610,598 to Chen (hereafter *Chen*) in view of U.S. Patent No. 6,552,368 to Tamai *et al.* (hereafter *Tamai*).

For a claim to be properly rejected under 35 U.S.C. § 103, "[t]he PTO has the burden under section 103 to establish a *prima facie* case of obviousness. It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988) (Citations omitted). Further, "[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." *In re Fritch*, 972 F.2d 1260, 1266, 23 U.S.P.Q.2d 1780 (Fed Cir. 1992).

The Office Action states:

> [r]egarding claim 4 and 8-16, Chen discloses surface-mounted devices of light emitting diodes with small lens where in Figs. 6 and 7 an optical source comprising an optical emitter 3, an encapsulant 5 covering the optical emitter, a diffractive element on top (6A in Fig. 7) integrated into the encapsulant where the encapsulant passes light from the optical emitter to the diffractive element and where the optical emitter is positioned on substrate 1. Chen fails to disclose required predesignated pattern diffraction and the heatsink. However, Tamai et al. disclose a light emission device where in Fig. 1, predetermined diffraction with the help of diffractive element 5 is disclosed. Furthermore, upper portion of the frame along with diffractive element acts as the heatsink for the light emitter.
>
> It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required predesignated light diffraction and conductive heatsink in Chen as taught by Tamai et al. in order to have a light emitting device with flexible light output and with better power management.

The Office Action continues:

> Examiner considers the portions "encapsulant intercepts and passes light from the optical emitter tot he diffractive element >> and << diffractive element diffracts the light to form a predesignated optical radiation pattern" in claim 4 and "diffractive element diffracting the optical signal to form a predesignated optical radiation pattern" in claim 8 to be product-by-process type. Furthermore, since end product of Chen and Tanaka is capable of doing what's described above, no patentable weight is given to those portions.

Chen discloses small lenses arranged in an array. According to *Chen*, "[t]his structure is a surface composed of several small lenses that collect most of the light inside the component and then emit. This is because the convex surface of the small lens enlarges the critical angle, which means enlarging the angle inside the component that allows it to emit the light effectively, and then increase the brightness of the entire SMD LED." *See Chen*, col. 3, lines 19-26.

Tamai discloses a light emission device including a light emitter, a light reflection member, and a resin sealing the light emitter by covering the light reflection member and the light emitter. *See Tamai*, Abstract. Importantly, *Tamai* discloses a light reflection member 5 and not a diffractive element as alleged in the Office Action.

Tamai continues stating:

> [t]his light emission device includes a light emitter 1 such as a light emitting diode (LED), a semiconductor laser (LD) or the like, a first lead frame 2 on a saucer portion of which the light emitter 1 is die-bonded, second lead frame 3, a bonding wire 4 connecting the second lead frame 3 with the light emitter 1, and a light reflection member 15 [sic] formed of metal. These parts are sealed by a transparent mold resin 6.

See Tamai, col. 4, lines 34-42.

Tamai then states:

> [t]herefore, in the light emitted from light emitter 1, light directed to the total reflection region 8 is substantially reflected with a boundary surface of mold resin 6, and further reflected by light reflection member 5 to be emitted forwardly from the total internal reflection region 8.

See Tamai, col. 4, lines 58-62.

From this it is abundantly clear that *Tamai* discloses a light reflection member 5 and not a diffractive element as alleged in the Office Action.

Applicants respectfully submit that the proposed combination fails to teach every element in Applicants' independent claims 4 and 8. Specifically, the proposed combination

fails to disclose, teach or suggest at least "a diffractive element integrated into the encapsulant, wherein the encapsulant intercepts and passes light from the optical emitter to the diffractive element wherein the diffractive element diffracts the light to form a predesignated optical radiation pattern and wherein the optical emitter is positioned at a conductive mounting site of a conductive heat sink and the optical source is a surface mount device," as recited in independent claim 4.

Further, the proposed combination fails to disclose, teach or suggest at least "a diffractive element integrated into an encapsulant covering the optical emitter, intercepting the provided optical signal and diffracting the optical signal to form a predesignated optical radiation pattern," as recited in independent claim 8.

Applicants respectfully disagree with the statement in the Office Action that:

> [r]egarding claim 4 and 8-16, Chen discloses surface-mounted devices of light emitting diodes with small lens where in Figs. 6 and 7 an optical source comprising an optical emitter 3, an encapsulant 5 covering the optical emitter, a diffractive element on top (6A in Fig. 7) integrated into the encapsulant.... and where the optical emitter is positioned on substrate 1.

Applicants respectfully submit that *Chen* discloses several small lenses and fails to disclose, teach or suggest a diffractive element. Applicants also respectfully submit that nowhere does *Chen* disclose, teach or suggest an optical emitter positioned on the substrate 1. Instead, *Chen*, in FIG. 6, shows that the optical emitter 3 is located on element 2, which is not described as a substrate. None of the elements in FIG. 6 of *Chen* are described in *Chen's* specification. The Office Action apparently assumes that element 1 in *Chen's* FIG. 6 is a substrate and that element 3 in *Chen's* FIG. 6 is an emitter. If the assumption in the Office Action is correct, then *Chen* shows that the light emitter 3 is located on element 2, which intervenes between elements 1 and 3. Accordingly, Applicants respectfully submit that the proposed combination fails to disclose, teach or suggest each element in Applicants' claim 4.

Nor does *Tamai* disclose, teach or suggest a diffractive element. *Tamai* discloses a reflection member 5.

Applicants also respectfully disagree with the statement in the Office Action that:

> [i]t would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required predesignated light diffraction and conductive heatsink in Chen as taught by Tamai et al. in order to have a light emitting device with flexible light output and with better power management.

Applicants respectfully submit that the invention attempts to optimize the optical radiation pattern of the light emitted from an optical source, and not to "have a light emitting device with flexible power management and with better power management" as suggested by the Office Action.

For at least the reasons stated above, Applicants respectfully submit that the proposed combination fails to disclose, teach or suggest each element in independent claims 4 and 8. Further, Applicants respectfully submit that claims 9-16 are allowable for at least the reason that they depend, either directly or indirectly, from allowable claim 8. *In re Fine, supra.*

No Motivation to Combine *Chen* with *Tamai*

Applicants respectfully submit that there is no motivation to combine *Chen* with *Tamai* to arrive at the present invention. Applicants respectfully submit that there is nothing in *Chen* and *Tamai* that would motivate one having ordinary skill in the art to combine these references to arrive at Applicants' claimed invention because neither *Chen* nor *Tamai* disclose, teach or suggest a diffractive element integrated into the encapsulant, wherein the encapsulant intercepts and passes light from the optical emitter to the diffractive element wherein the diffractive element diffracts the light to form a predesignated optical radiation pattern and wherein the optical emitter is positioned at a conductive mounting site of a conductive heat sink and the optical source is a surface mount device. Further, the proposed combination fails to provide either a reasonable expectation of success of combining the references to achieve the invention, or show any relevance to the problem solved by Applicants' invention. Further, the Office Action fails to articulate a clear motivation to make the proposed combination.

Specifically, Applicants respectfully submit that the Office Action fails to establish a *prima facie* case of obviousness because the Office Action has not pointed out the specific teachings in *Chen* and *Tamai* that would motivate one having ordinary skill in the art to

combine the references to arrive at Applicants' invention. Indeed, neither *Chen* nor *Tamai* disclose, teach or suggest a diffractive element integrated into the encapsulant, wherein the encapsulant intercepts and passes light from the optical emitter to the diffractive element wherein the diffractive element diffracts the light to form a predesignated optical radiation pattern and wherein the optical emitter is positioned at a conductive mounting site of a conductive heat sink and the optical source is a surface mount device.

Further, Applicants respectfully disagree with the conclusory statement in the Office Action that:

> [i]t would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required predesignated light diffraction and conductive heatsink in Chen as taught by Tamai et al. in order to have a light emitting device with flexible light output and with better power management.

Applicants respectfully submit that one having ordinary skill in the art would not be led toward the claimed structure because neither *Chen* nor *Tamai* suggests the structure recited in claims 4 or 8.

Product-By-Process Limitations

Applicants respectfully disagree with the characterization that claims 4 and 8 include product-by-process limitations that are to be afforded no patentable weight. The Office Action states that:

> Examiner considers the portions "encapsulant intercepts and passes light from the optical emitter tot he diffractive element >> and << diffractive element diffracts the light to form a predesignated optical radiation pattern" in claim 4 and "diffractive element diffracting the optical signal to form a predesignated optical radiation pattern" in claim 8 to be product-by-process type. Furthermore, since end product of Chen and Tanaka is capable of doing what's described above, no patentable weight is given to those portions.

Applicants respectfully submit that claims 4 and 8 do not contain product-by-process limitations. According to MPEP § 2113:

> [E]ven though product-by-process claims are limited and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior

> product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

Neither claims 4 nor 8 state process limitations for creating the structure defined by the claims. Indeed, claims 4 and 8 recite structure that is not disclosed, taught nor suggested by the proposed combination, as mentioned above. Applicants respectfully submit that claims 4 and 8 recite features that result from the structure. Further, while not conceding that the proposed combination discloses a device that could perform all of the functions of the optical source recited in claims 4 and 8, MPEP §2114 states, in part:

> [e]ven if the prior art device performs all the functions recited in the claim, the prior art cannot anticipate the claim if there is any structural difference. It should be noted, however, that means plus function limitations are met by structures which are equivalent to the corresponding structures recited in the specification. *In re Ruskin*, 347 F.2d 843, 146 USPQ 211 (CCPA 1965) as implicitly modified by *In re Donaldson*, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994).

Claim 4 recites "a diffractive element integrated into the encapsulant, wherein the encapsulant intercepts and passes light from the optical emitter to the diffractive element, wherein the diffractive element diffracts the light to form a predesignated optical radiation pattern and wherein the optical emitter is positioned at a conductive mounting site of a conductive heat sink and the optical source is a surface mount device." Applicants respectfully submit that this is not a product-by-process limitation because the limitation has no effect on how the optical emitter is constructed.

Claim 8 recites "a diffractive element integrated into an encapsulant covering the optical emitter, intercepting the provided optical signal and diffracting the optical signal to form a predesignated optical radiation pattern." Applicants respectfully submit that this is not a product-by-process limitation because the limitation has no effect on how the optical emitter is constructed.

Accordingly, Applicants respectfully submit that claims 4 and 8 do not contain product-by-process limitations.

Furthermore, an end product formed by combining *Chen* and *Tamai* would not result in an encapsulant that "intercepts and passes light from the optical emitter to the diffractive element wherein the diffractive element diffracts the light to form a predesignated optical

radiation pattern," as recited in claim 4, or "a diffractive element integrated into an encapsulant covering the optical emitter, intercepting the provided optical signal and diffracting the optical signal to form a predesignated optical radiation pattern," as recited in claim 8 because the proposed combination fails to disclose, teach or suggest these elements.

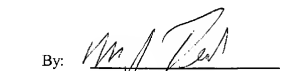
For at least the reasons stated above, Applicants respectfully submit that the proposed combination is improper, and further, that the proposed combination fails to disclose, teach or suggest all the elements of the claimed invention. Accordingly, Applicants respectfully request that the rejection of claims 4 and 8-16 be withdrawn.

CONCLUSION

Should the Examiner have any comment regarding the Applicants' response or believe that a teleconference would expedite prosecution of the pending claims, Applicants request that the Examiner telephone Applicants' undersigned attorney.

Respectfully submitted,

Smith Frohwein Tempel Greenlee Blaha LLC
Customer No. 35856

By: 

Michael J. Tempel
Registration No. 41,344
(770) 709-0056